Figure 1

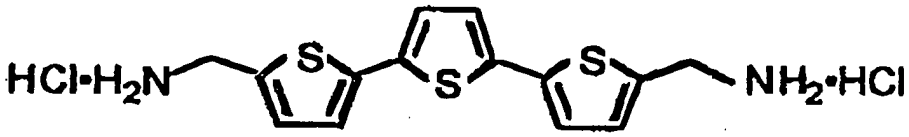
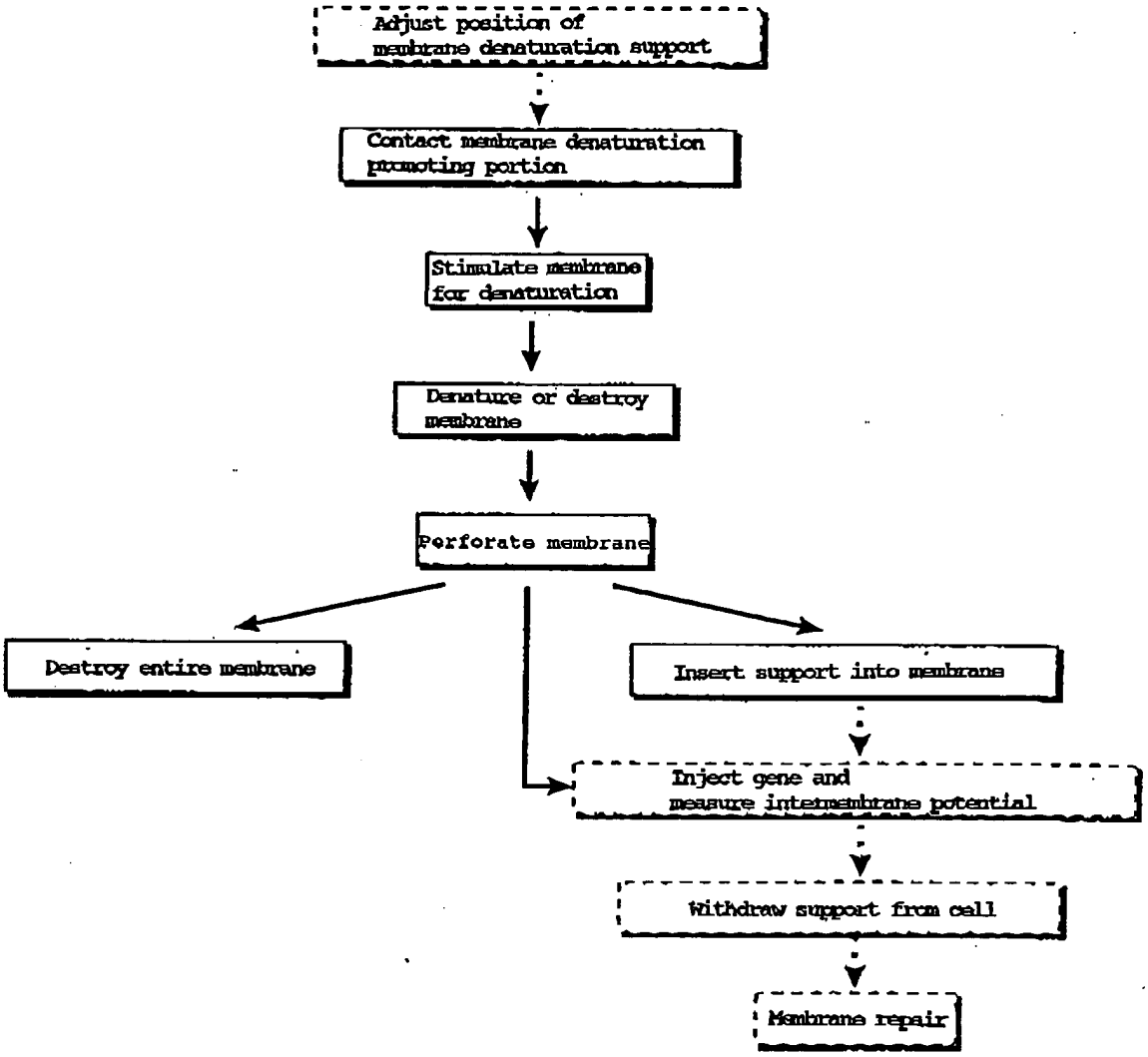
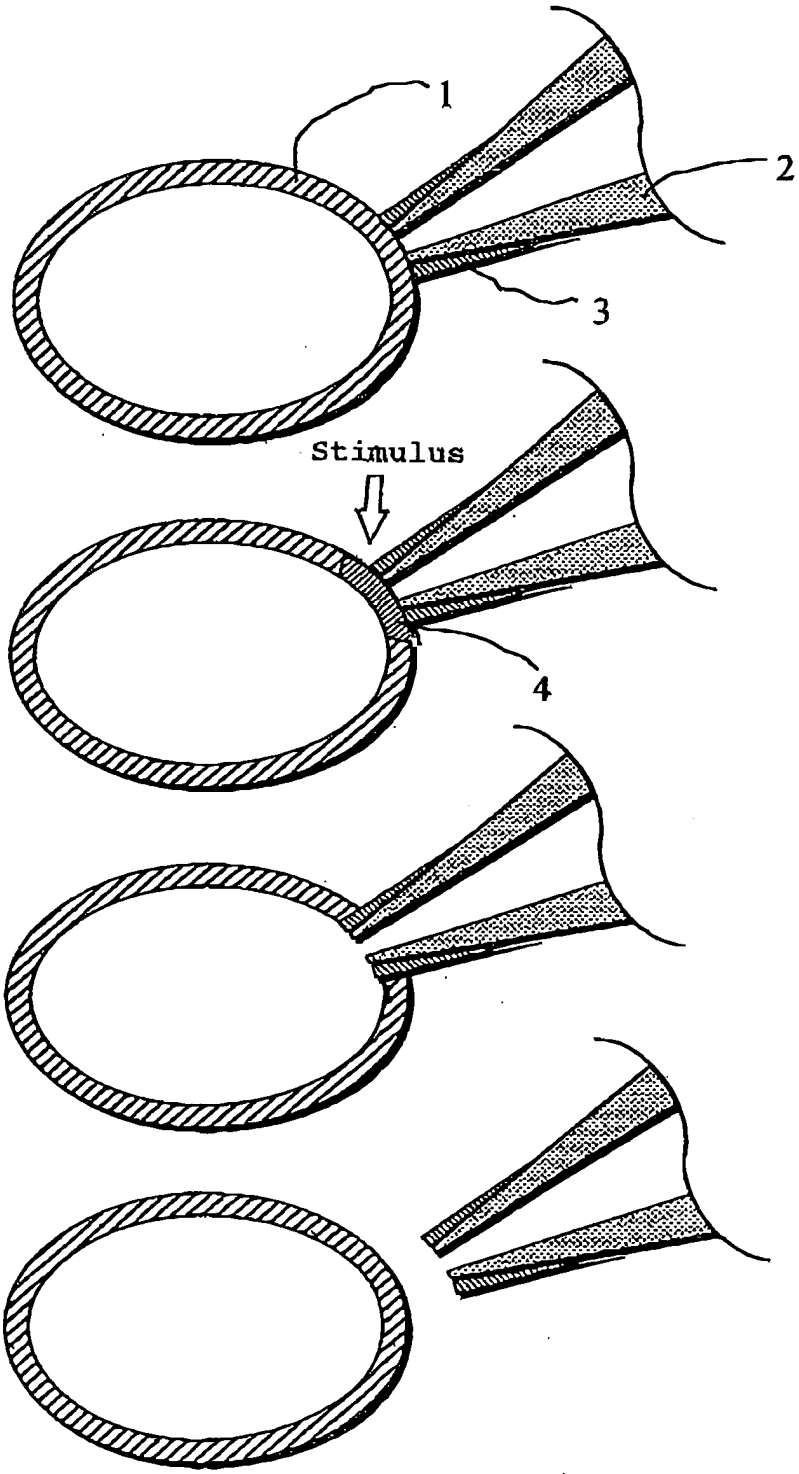


Figure 2



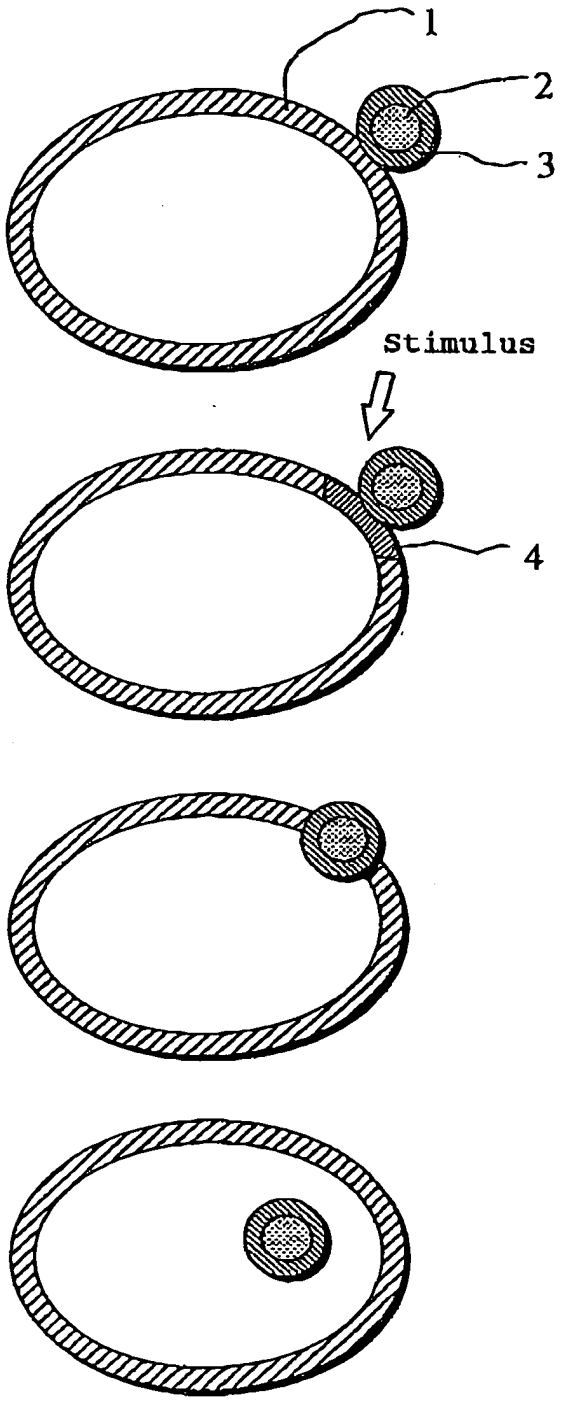
Flow chart of membrane perforation technique

Figure 3



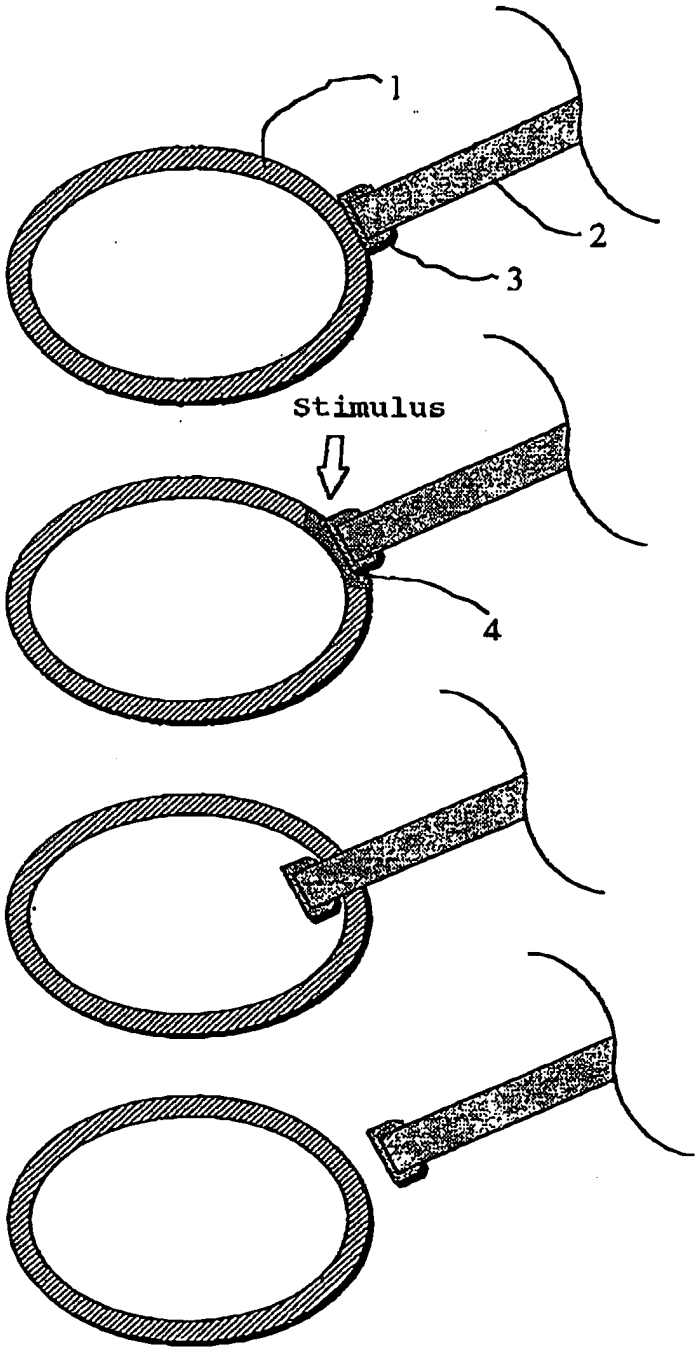
1 Membrane structure
2 Support
3 Membrane denaturation promoting portion
4 Denatured portion of membrane

Figure 4



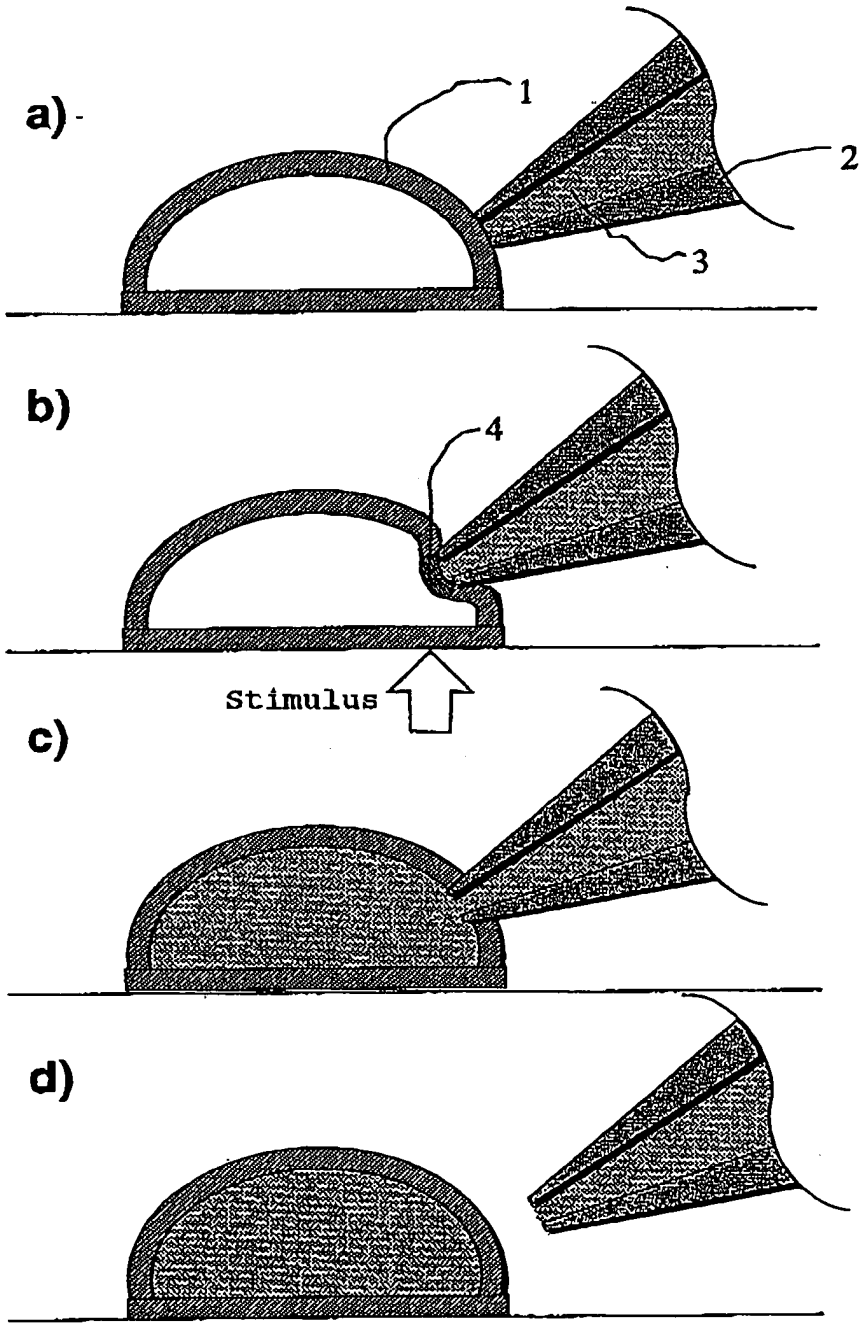
1 Membrane structure
2 Support
3 Membrane denaturation promoting portion
4 Denatured portion of membrane

Figure 5



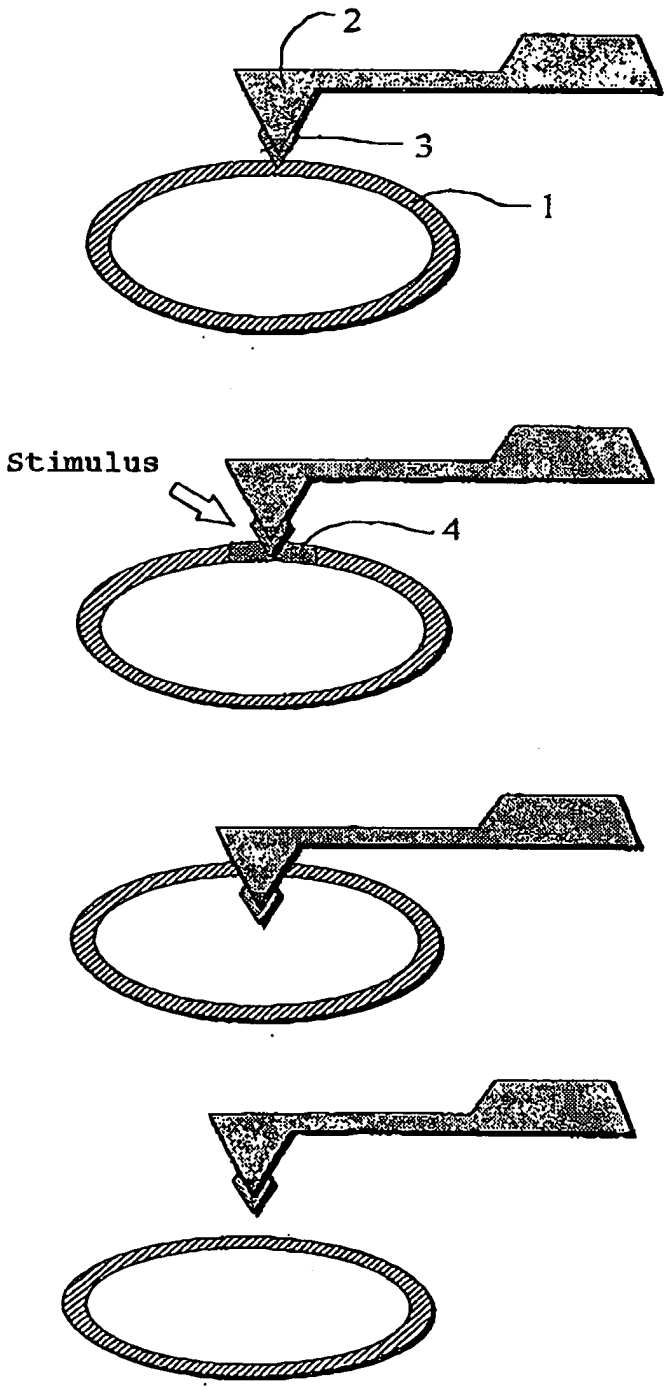
1 Membrane structure
2 Support
3 Membrane denaturation promoting portion
4 Denatured portion of membrane

Figure 6



1 Membrane structure
2 Support
3 Liquid containing membrane denaturation promoter
4 Denatured portion of membrane

Figure 7



1 Membrane structure
2 Support
3 Membrane denaturation promoting portion
4 Denatured portion of membrane

Figure 8

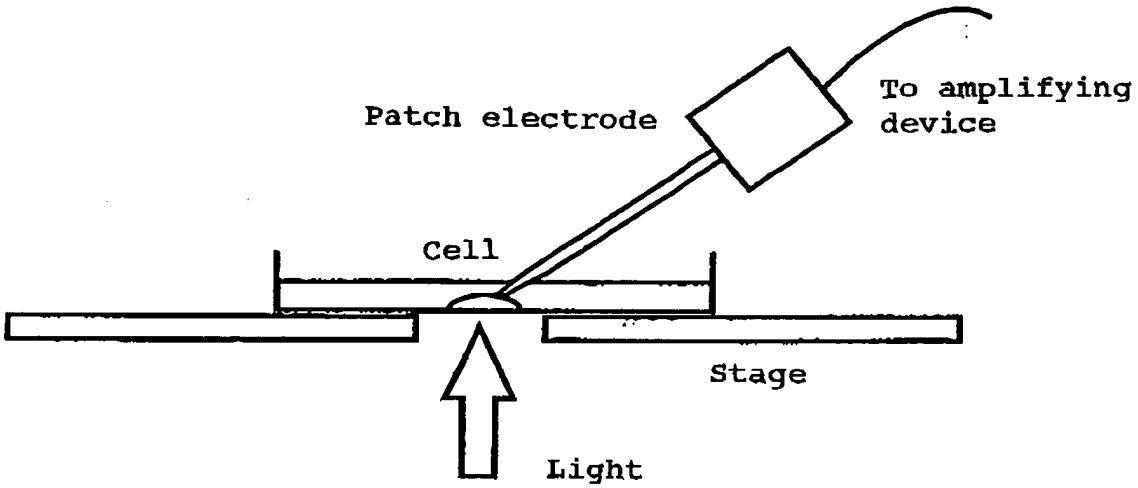


Figure 9

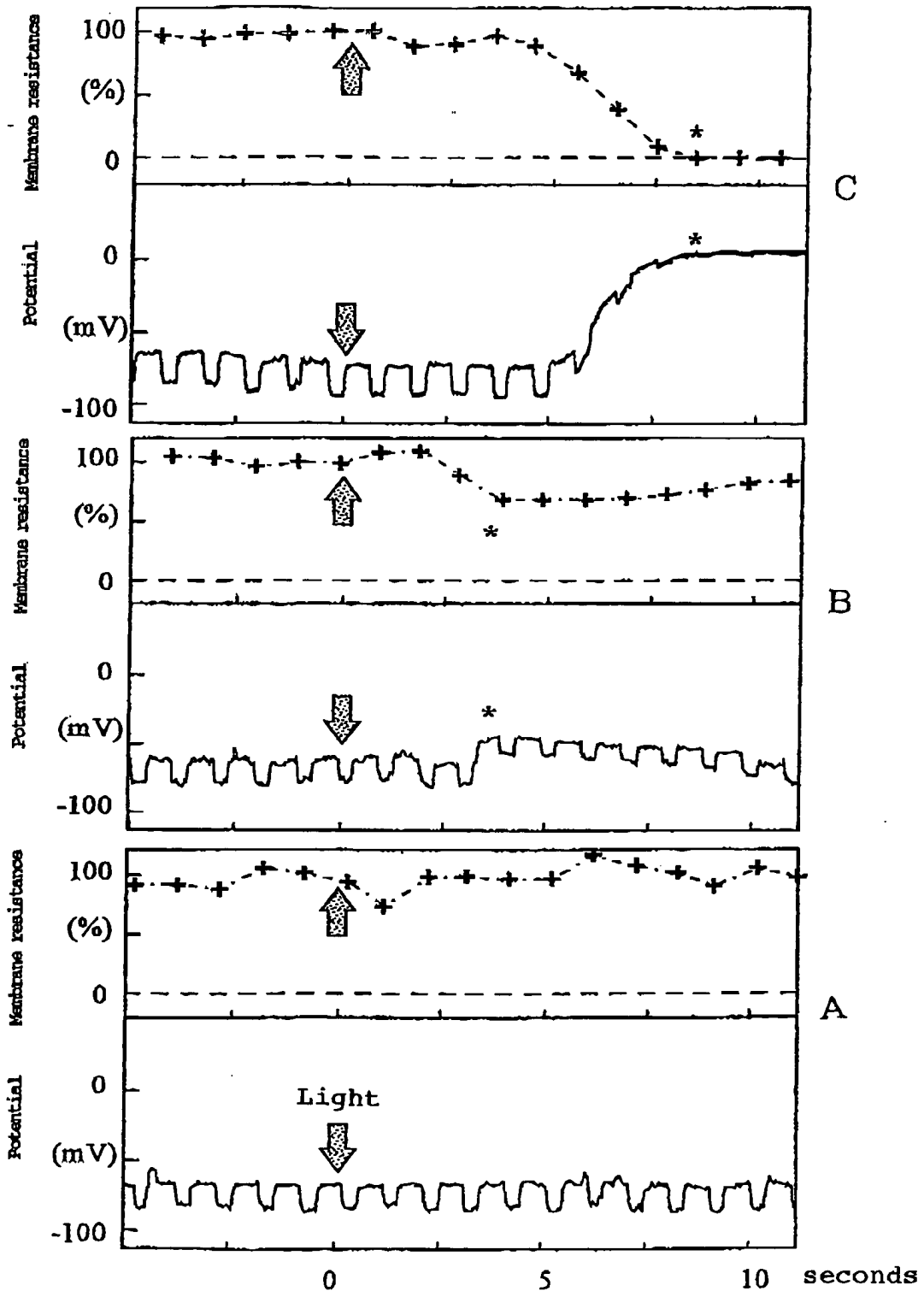

Membrane resistance
100
(%)
0
Potential
0
(mV)
-100
C
B
A
Light
0
5
10
seconds

Figure 10

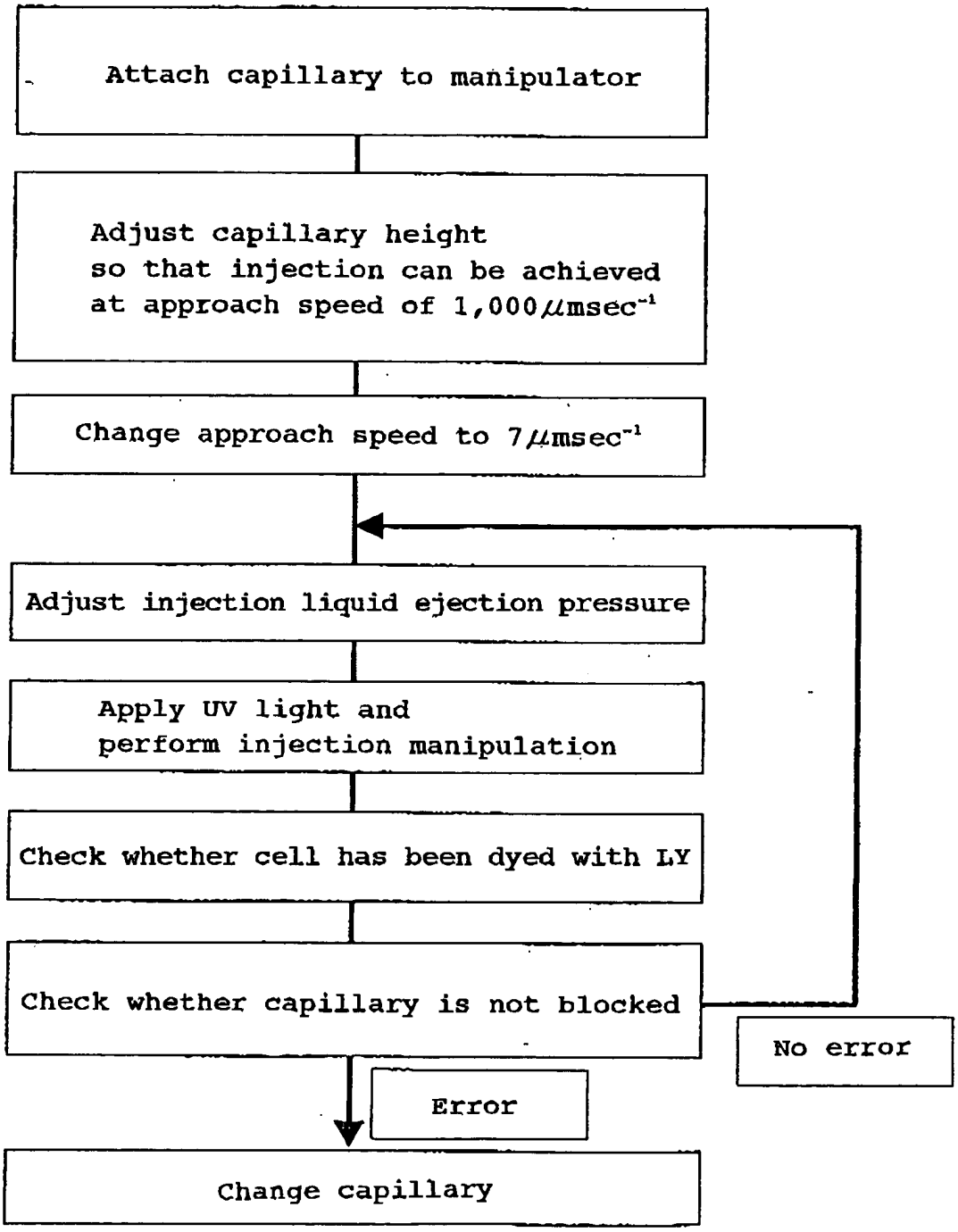
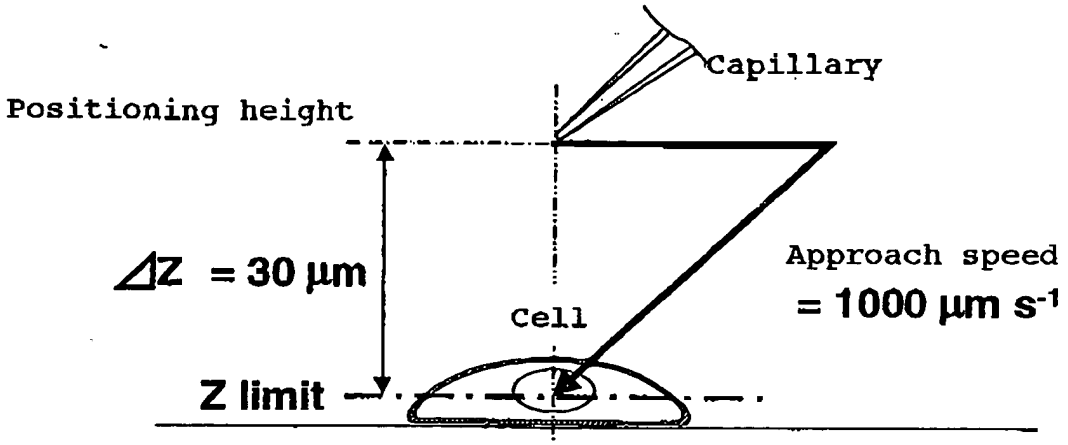
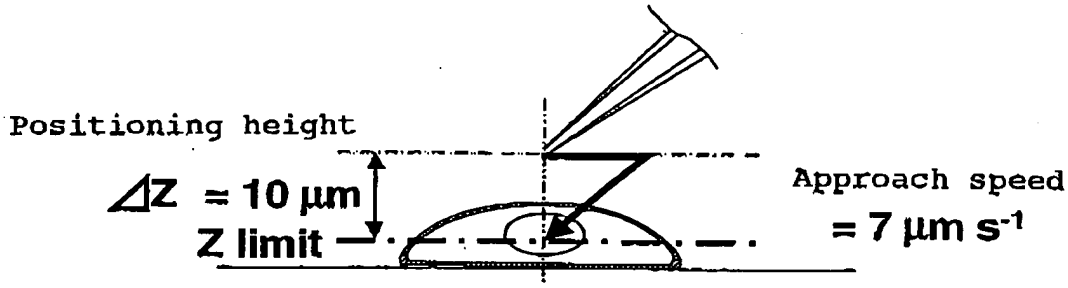

Attach capillary to manipulator
Adjust capillary height so that injection can be achieved at approach speed of 1,000μmsec⁻¹
Change approach speed to 7μmsec⁻¹
Adjust injection liquid ejection pressure
Apply UV light and perform injection manipulation
Check whether cell has been dyed with LY
Check whether capillary is not blocked
No error
Error
Change capillary

Figure 11



1) Execute normal microinjection to check whether Z limit has been appropriately set



2) Change settings such that approach is made at speed at which insertion is difficult, and evaluate effects of photosensitizing on injection efficiency

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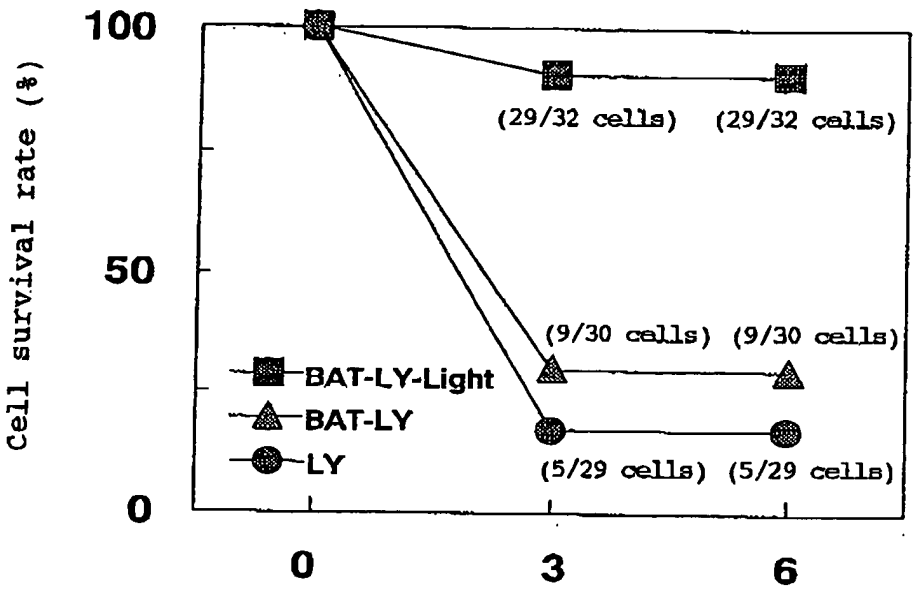
Figure 12

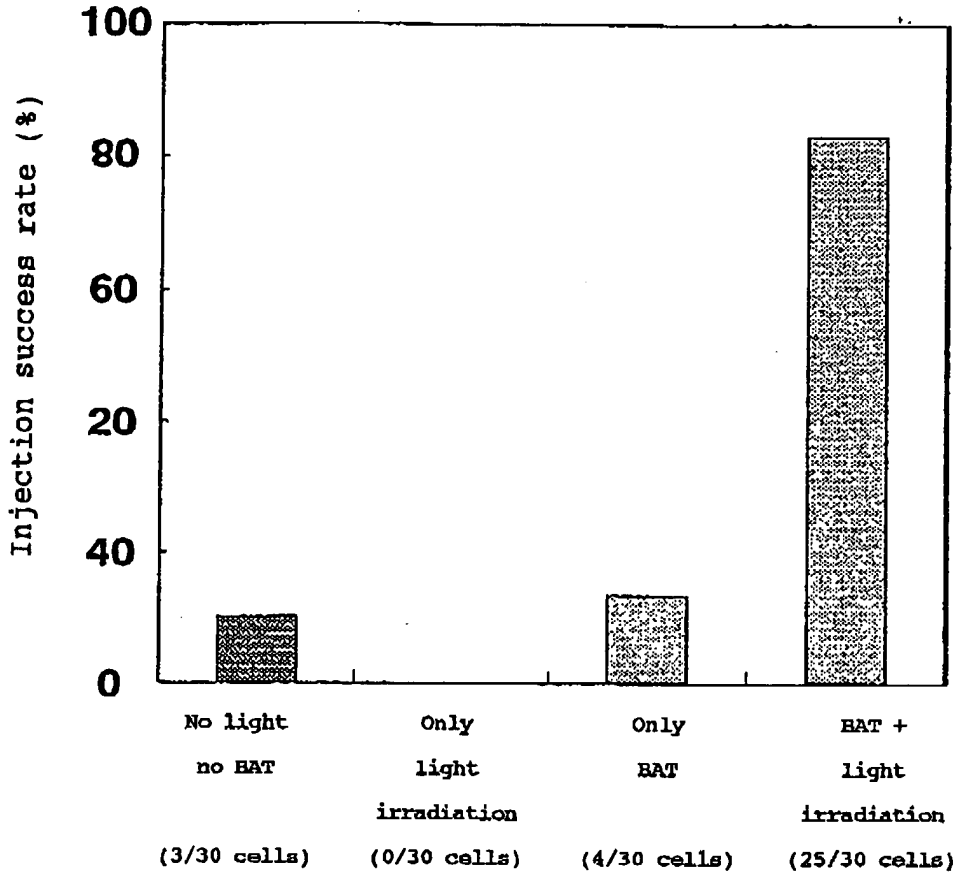


BAT-LY-Light: LY+BAT containing liquid; photosensitizing injection; attempted on 32 cells

BAT-LY: LY+BAT containing liquid; normal injection; attempted on 30 cells

LY: LY containing liquid; normal injection; attempted on 29 cells

Figure 13


100
80
60
20
40
0
Injection success rate (%)
No light
no BAT
(3/30 cells)
Only
light
irradiation
(0/30 cells)
Only
BAT
(4/30 cells)
BAT +
light
irradiation
(25/30 cells)